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BARK BEETLE CONDITIONS IN THE CONIFEROUS FORESTS OF FOREST SERVICE REGION 4

NOVEMBER 1960

By

R. I. Washburn and J. A. E. Knopf
Entomologists

DIVISION OF FOREST INSECT RESEARCH
INTERMOUNTAIN FOREST AND RANGE EXPERIMENT STATION
Reed W. Bailey, Director
Forest Service
U. S. Department of Agriculture
Ogden, Utah

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INTRODUCTION

This report presents current information on infestations of bark beetles in conifer stands on lands of all ownerships in the territory covered by the U. S. Forest Service Region 4. There are at present epidemics of mountain pine beetle in lodgepole and ponderosa pine, Engelmann spruce beetle in Engelmann spruce, Black Hills beetle in ponderosa pine, Douglas-fir beetle in Douglas-fir, and engraver beetles in alpine and white firs in various parts of the region.

Lodgepole pine is found in northern Utah, western Wyoming, and southern Idaho. Engelmann spruce occurs throughout most of Region 4 at various elevations. Ponderosa pine is distributed throughout southern Idaho; an extensive area on the Dixie National Forest, with Panguitch, Utah, being about the center of type; a small area south and east of Manila, Utah; limited amounts on the Manti-LaSal National Forest near Moab, Utah; on Charleston Mountain, Nevada; and on the Toiyabe National Forest near Reno, Nevada, which represents the eastern edge of the east side ponderosa stands of California. Douglas-fir occurs throughout the region. Alpine fir is distributed throughout the region between 3,500 feet and timber line.

Throughout the Intermountain states during the past two years precipitation, particularly during the growing season, has been below normal, with many forested areas suffering from serious drought conditions. Dry seasons such as we are currently experiencing appear to be associated with the following characteristics noted in connection with bark beetle attacks.

In areas where less than normal rainfall has occurred most coniferous species tend to lose some of their ability to successfully pitch out attacking bark beetles. If sap flow is inadequate due to a partial dehydration of host trees it is easier for the beetles to complete their attacks and for broods to develop without the hinderance of a copious sap flow.

This report is a consolidation of information on bark beetle infestations occuring in Forest Service Region 4 during 1960, as determined from evaluation surveys. The objective of this report is to present the entomological significance of each infestation. A map of Region 4 showing relative position of the infestations and detailed maps of each infestation are appended.

MOUNTAIN PINE BEETLE

Targhee National Forest

The mountain pine beetle has shown definite epidemic tendencies on the Targhee National Forest for the last few years. As these epidemic centers have developed, control action has been initiated. In most cases control efforts have been successful in materially reducing the bark beetle populations.

Aerial detection surveys during the fall of 1960 showed a relatively large infestation of mountain pine beetle building up on Federal and State lands in the vicinity of Moody Creek and Mud Springs. This area is adjacent to the Hawley Gulch infestation that was treated two years ago. Lodgepole pine in larger diameter classes (8 inches and above) were found to be supporting heavy broods. Attacks averaged 15.6 starts per sq. ft. with 94.8 in. of gallery. Broods were healthy in appearance and larvae averaged 205.4 per sq. ft. on September 29,1960. An estimated 2,000 acres contain approximately 3,000, 1960 attacked trees. At the time entomologists made their evaluations, a decided lack of predators and parasites was noted. All of these facts indicate an increasingly serious situation.

In the course of ground checking, a small area of infestation was found on forest land northeast of heavily hit lodgepole pine stands around Sheridan Reservoir. Attacked trees were found in groups and as scattered singles between Taylor and Snider Creeks. It is estimated that 100 to 150 trees are currently infested. Forest lands north of Sheridan Reservoir could possibly be infested by beetles being spread by winds, and in the past small outbreaks have occurred periodically adjacent to the Sheridan Reservoir epidemic centers. Close surveillance should be kept to detect future outbreaks of this nature.

The infestation in the vicinity of Sheridan Reservoir, near Kilgore, Idaho, continues to show epidemic tendencies. Early spring investigations showed that large numbers of beetle brood survived the winter.

Because of the threat posed by this infestation, a cooperative Federal, State, and private control program was started immediately after the spring investigations. Due to the intensity and epidemic tendency of this infestation, additional control work should be done unless, of course, the trend should reverse itself due to unusual climatic conditions. Certainly biological agents are presently insufficient to cause an immediate reversal of the trend.

Grand Teton National Park

It was reported in 1959 that mountain pine beetle activity had steadily increased since 1955 in Grand Teton National Park in spite of effective treating programs. This year, entomological appraisals show that beetle populations are still increasing at an accelerated rate. A decided lack of predators and parasites, unusually favorable weather conditions for brood development, and an abundance of suitable host material are probably the factors responsible for increased numbers of trees being attacked this year.

One new attack center was detected during aerial surveys on the south slope of Pilgrim Mountain. This unit was heavily hit and ratios of red tops to new attacks were as high as 1:10. Brood density, inches of gallery, and number of gallery starts varied throughout the epidemic center, but in every case indicated epidemic tendencies. This particular infestation was divided into 4 strata on the basis of apparent variation in brood density. In the two areas showing the lowest brood density (around 180 per sq. ft.) there were fewer attacks and inches of gallery than in the two areas showing brood density above 200 per sq. ft. of bark surface.

All units experienced an increase in numbers of new attacks except Two Ocean Lake, Donoho Pt., and Jackson Lake.

Summary of population density data for
mountain pine beetle infestations in lodgepole pine

Unit	Area in acres	No. of infested trees	Brood density sq. ft.	Gallery starts	In. of gallery
Pilgrim Mtn.	600+	1,500 +	206.6	7.6	44.4
Signal Mtn.	2,000	7,000	215.2	16.4	128.8
East Signal Mtn.	800	800	193.6	11.2	104.8
Two Ocean Lake	1,000 +	100	No fall data recorded		
Donoho Pt.	300	300	" " " "		
Jackson Lake	600 +	300	" " " "		
Totals	5,300	10,000 ± 2,000			

Woodpecker populations that have been relatively active in the past appear to have dropped off in all units. Insect predator and parasite populations were light in all of the units that were biologically evaluated. With this in mind we feel that a continuation of the treating program is warranted on all units.

Teton National Forest

The Teton National Forest has been treating epidemic centers of mountain pine beetles each year since 1956. In some centers the beetle population has been reduced sufficiently that control action is not now necessary. There are areas, however, where additional treatment is desirable.

Several new areas of infested lodgepole pine were found during the course of aerial detection surveys. For the most part, attacked trees were within or adjacent to old known infestation centers. One new area containing over 200 attacked trees was found on the east side of Pacific Creek. Station entomologists determined that the buildup of old trees (red tops) to new attacks (attacked 1960) was 1:6. This, coupled with heavy broods, indicates that beetle populations have an explosive potential to infest surrounding stands of mature to overmature lodgepole pine.

Another new infestation is on Pilgrim Mountain. This infestation is on both Grand Teton National Park and the Teton National Forest. It is estimated that approximately 500 of the 2,000 infested trees are on the national forest (see Grand Teton National Park writeup).

Other areas where fading was observed from the air are: Deer Ridge, W. Shoal Creek, Granite Creek, Spread Creek, Lost Creek, Ditch Creek, Antelope Mountain, and the Hoback Rim.

Most of the infested lodgepole in the vicinity of Hoback Rim occurs south of Highway 189 on State and private land where an estimated 1,000 attacked trees are currently fading. Evaluations showed relatively high brood counts and the over-all indications point toward increasing mountain pine beetle activity on this unit. This area has a past history of persistent mountain pine beetle activity and further losses are to be expected if mature and overmature trees are not harvested.

Entomological appraisals in all infested centers showed an increasing trend. Red top to new attack ratios in all cases were 1:1 or more, and in most instances a greater than 1:1 ratio was the rule. Also, the relative abundance of predators and parasites has dropped considerably. It was determined that mountain pine beetles are generally on the increase throughout the Teton National Forest.

Wasatch National Forest

Since 1958, control efforts have been concentrated on a massive outbreak of mountain pine beetle infesting lodgepole pine stands on the north side of the Wasatch National Forest. Treating has been effective during the past three years in reducing the over-all beetle populations and has materially reduced the size of the epidemic area. In the areas not treated to date the buildup ratio has increased sharply; attack intensities of 20 trees or more per acre are not uncommon. Also, infested trees that were left untreated in areas treated only once had the potential of infesting 2-5 trees in the succeeding year. This points out the need to cover each area at least twice. Unfortunately, the over-all biological potential of the beetle remains at an extremely high level. Biological evaluations this past season have shown that insect predator and parasite populations remain at an ineffective level. Woodpecker populations are increasing but they cannot conceivably exert enough biological pressure to curb the rapidly rising beetle populations. This picture is further complicated by the fact that an extremely dry summer has provided favorable conditions for the mountain pine beetle. Therefore, we feel certain that losses will continue at an accelerated rate unless the beetle population is drastically reduced through treatment or widespread winter kill.

This year, an estimated 500 lodgepole pines were attacked by mountain pine beetle in the Provo River drainage. Entomologists found that brood densities were not alarmingly high, but they still presented a threat to the recreational values of this high use area. Forest crews planned to treat these trees this fall.

An infestation on Iron Mine Mountain was picked up during aerial surveys in the fall of 1958. Since that time Station entomologists have made periodic evaluations in the area. Although brood densities declined slightly from 1959 to 1960, the attack potential has remained high due to favorable weather and scarcity of natural enemies. This year an estimated 1,200 to 1,500 trees are infested.

Two other small areas were evaluated. Approximately 50 lodgepole pine are infested with mountain pine beetle in the Smith Morehouse drainage. There is a possibility that the remaining lodgepole pine could be attacked, therefore, treatment of this infestation could be justified to preserve the recreational area.

Gardner Fork was also looked at and it was found that the majority of infested trees were pole size. Mountain pine beetles have a relatively hard time establishing broods in trees this size and it is doubtful that this infestation will become serious.

Ashley National Forest

Mountain pine beetle activity has been observed on the Ashley National Forest since 1956. Several infestations have not developed epidemic tendencies and consequently have been left to run their course, while others, such as Pole Creek, developed into epidemics. Direct control measures reduced the beetle population in Pole Creek to a level where direct control is no longer necessary.

Infestations in the following areas caused concern in 1960. Brown Duck Creek, Miners Gulch, and Bear Wallow.

Infested mature and overmature lodgepole pine are scattered throughout the pole size timber in Brown Duck Creek. This infested area covers approximately 2,000 acres and the Ashley National Forest personnel estimate 2,000 newly attacked trees. Entomologists' evaluations show a 1:2 buildup ratio occurred in 1959 with the present population indicating a somewhat static trend. An additional biological evaluation is planned for next spring to reassess the potential and trend of this infestation.

Currently 600-700 lodgepole pine are infested on approximately 100 acres in Miners Gulch. This area is partially isolated but insect populations could eventually threaten adjacent lodgepole and ponderosa pine stands. Evaluations in the spring of 1961 should provide more accurate data to determine if a treating program is needed.

There are approximately 1,200 infested trees on national forest land and 500 on the Uinta-Ouray Indian Reservation in the Bear Wallow area. This infestation is in a mixed age type with considerable lodgepole pine of which approximately 60 percent are poles, 30 percent mature trees, and 10 percent overmature trees. Biological evaluations show a greater brood density than in Brown Duck Creek, but still below epidemic level. However, a potential exists that might result in explosive conditions in the future.

The infestation detected several years ago in Lake Creek, near the junction of Oweep Creek appears to be increasing in size and intensity. Unfortunately, we have not been able to make a fall evaluation of this infestation so definite biological information is not presently available.

The old infestation in Hells Canyon that we have watched for several years appears to have remained relatively static. This infestation is located in the scattered groups of mature lodgepole distributed throughout the pole-size timber in the Hells Canyon-Cow Creek area. This infestation should be checked each year to determine its potential. If epidemic tendencies develop this infestation could represent a threat to the mature timber in and around Flea Flat and the Yellowstone drainage.

Toiyabe National Forest

The aerial detection survey of the Toiyabe National Forest revealed no new bark beetle outbreaks of any consequence. The Charleston Mountain district appeared exceptionally free of recently faded bark beetle trees.

The Crystal Bay infestation, on the north shore of Lake Tahoe, persists with the beetle population density and parasite-predator relationship at about the same level as last year. The Crystal Bay Development Company, the new owners of the Crystal Bay area, are concerned about the infestation and are taking steps to reduce the loss of timber caused by the beetle. Their program is being handled without Federal financial assistance. Briefly, the program involves the removal of infested trees and a general thinning of the stand in the areas being developed for houses, shops, etc. There is a possibility that some infested trees will be removed next year in areas not scheduled for immediate development.

Sawtooth National Forest

Active infestations of mountain pine beetle have been chemically treated for the past three years. Larger and older infestations were located primarily within the South Fork, Boise River drainage. Smaller and less intensive outbreaks developed in 1959 within the Warm Springs Creek and Woods River drainages.

Chemical control of these infestations has reduced the beetle population and trees per acre attacked to a satisfactory level. Present indications are that only a maintenance type program will be required in 1961.

Boise National Forest

The second year of control by the cut, deck, and burn method has reduced mountain pine beetle populations in second-growth ponderosa pine, near Atlanta, Idaho, to a low level. Some maintenance control might be required in 1961, depending on results of operational surveys. Biological evaluations were not conducted in the fall of 1960 due to the lack of infested trees for sampling.

Dixie National Forest

In last year's report it was noted that Black Hills beetle populations showed a definite downward trend in ponderosa pine stands. This year biological evaluations show that for the most part beetle populations are continuing to decline. Southern Utah ponderosa pine stands, in the past few years, have been subjected to severe drought conditions and past records have shown that Black Hills beetle outbreaks often coincide with drought conditions. A situation such as this warrants continued surveillance to detect any new infestation centers, and some additional control on the few remaining hot spots is advisable.

DISCUSSION

In 1959, twenty-two infestation centers were reported in lodgepole pine stands of Region 4. Twenty of these areas were treated during the 1960 season, and nearly all will need additional control in 1961. This year ten new infestation centers were found, most of which were in close proximity to older known infestations. All but two of these areas were found during the course of annual aerial detection surveys, some of which show a population potential indicating a serious upward trend.

For the most part, control in treated areas was effective. However, increased numbers of trees were infested during the 1960 flights. This can be explained by considering the following factors: (1) Because of the large size of some areas it was physically and financially impossible to cover the entire area of infestation. (2) Drought has weakened trees sufficiently so that fewer attacking beetles succeed in killing trees that, under normal conditions, might survive. (3) Predators and parasites have been at a low level in most infestation centers. (4) More beetle brood has survived. (5) New infestation centers have been found.

Following this section a table giving forest, unit, and brood densities is presented. Brood densities generally were lighter during the 1960 season than in 1959. One might wonder how the over-all trend of mountain pine beetle populations can continue its upward swing when brood densities appear to be below last year's averages. Even though the 1960 brood densities are lighter than in 1959, in most cases they remain above densities expected under epidemic conditions. The answer does not lie wholly in the interpretation of attack and brood numbers which are but one facet of a biological evaluation. The entomologist faces a highly challenging situation in interpreting intangible factors such as over-all influence of weather, presence or lack of parasite-predator complexes and/or other biotic agents. All are taken into consideration for formulating predicted trends.

Mountain Pine Beetle in Lodgepole and Second-growth Ponderosa Pine

Unit	DBH	Brood density	Gallery starts	Inches of gallery	Trend
Targhee		(Per square foot)			
Mud Springs	13.6	211.6	15.6	94.8	Increasing
Taylor-Snider Crs.	15.0	180.4	11.6	79.0	"
Sheridan Reservoir		(no fall data recorded)			"
Grand Teton National Park					
Pilgrim Mtn.	12.6	206.6	7.6	44.4	Increasing
Signal Mtn.	11.7	215.2	8.2	128.8	"
East Signal Mtn.	13.4	193.6	11.2	104.8	"
Two Ocean Lake		(no fall data recorded)			Static
Donoho Point		(no fall data recorded)			Decreasing
Jackson Lake		(no fall data recorded)			"
Teton					
Pacific Cr.	12.9	216.3	7.1	69.9	Increasing
Hoback Rim	12.7	193.2	6.2	87.2	"
Wasatch					
Provo River	12.6	170.4	2.0	18.6	Decreasing
Iron Mine Mtn.	15.9	191.6	5.4	47.2	Increasing
Wasatch Project	13.2	203.6	9.2	130.4	"
Ashley					
Brown Duck Cr.	12.8	128.0	3.0	38.8	Static
Miners Gulch	10.4	179.6	4.4	46.8	Increasing
Bear Wallow (forest))	14.0	138.0	2.4	42.8	(Static to
" " (Indian land))		198.0	5.2	54.8	(increasing)
Lake-Oweep Cr.		(no data recorded)			Increasing
Hells Canyon		(no data recorded)			Static
Sawtooth					
Sawmill Cr.	9.0	217.8	14.4	94.8	Decreasing
*Vienna Cr. Flats	12.9	78.0	10.0	69.8	"

Black Hills Beetle in Ponderosa Pine

Dixie - (pooled data from all sampling units)					
	20.3	94.6	-	-	Decreasing

*1960 flights were not completed at time samples were taken.

ENGELMANN SPRUCE BEETLE

Bridger National Forest

Since 1955 a combination of control measures consisting of logging, trap trees, and toxic chemicals have been directed against a highly persistent infestation of Engelmann spruce beetles in the upper Green River area. Late in July of 1960, biological evaluations were made in this area and Station entomologists found extremely heavy brood densities in all areas examined. All life stages of the beetle were sampled. Representative brood data are given for three areas as follows:

	Brood density/sq. ft.	Gallery starts/sq. ft.	Inches of gallery/sq. ft.
No. Gypsum Cr.	428.4	10.0	44.4 (standing trees)
Moose Cr.	447.6	16.6	81.2 (cull pieces and decked logs)
Moose Cr.	425.6	7.4	32.0 (standing trees)

The data show the highly aggressive nature of the beetle in its 1960 attacks. One- and two-year generation strains were found in all areas examined from Jim Creek to Moose Creek.

It was reported last year that predators and parasites were increasing in the areas subjected to two or more years of treatment. This year this trend seems to be reversing itself with the exception of woodpeckers. Currently, woodpeckers are on the increase but it is doubtful that they can keep up with rapidly increasing beetle populations.

Aerial detection surveys revealed that attacks have occurred in almost all of the remaining susceptible spruce type from Jim Creek to Moose Creek. Also, new areas of fading showed that infestations have progressed far down the slopes leading into the Green River Lakes.

The present infestation presents a threat to all spruce stands immediately adjoining this infestation. From the entomological viewpoint, it appears that the beetle population in this infestation should be reduced as rapidly as possible to prevent tremendous loss of Engelmann spruce.

Uinta National Forest

On June 30, 1958, Intermountain Station entomologists were called on to evaluate an apparently serious infestation of Engelmann spruce beetle on the Uinta National Forest. At that time it was determined that epidemic populations of the beetle were present and immediate control action should be undertaken to prevent widespread destruction in this valuable spruce stand.

The main area of infestation in 1958 was concentrated in the Soapstone drainage of the Uinta National Forest. Fringes of this infestation overlapped parts of the Ashley and Wasatch National Forests. All areas were effectively treated under a cooperative program involving the three forests.

Recommended suppression measures were mainly of two types: (1) Immediate logging of infested trees. (2) Chemical control of infested inaccessible standing trees and stumps, cull pieces and tops in cutover units. These methods were supplemented by use of felled trap trees in some areas that were either removed or treated after the flights were completed.

Recent biological evaluations of the spruce beetle-infested areas pointed up the following facts:

1. Standing tree attacks were at a minimum.
2. Predators and parasites, especially dipterous parasites of the genus *Medetera*, were increasing rapidly.
3. Good mortality was obtained on all treated units.
4. Logging operations are continuing to remove infested material at a rapid rate. If broods continue the observed downward trend, it is expected that only maintenance type control will be necessary in 1961.

It should be pointed out that through a control program properly carried out, an extremely destructive Engelmann spruce beetle epidemic has been brought under control in a relatively short period of time.

Ashley National Forest

This year, two small Engelmann spruce beetle infestations were treated in the Hell Hole and McAffe Basin drainages. Additional control may be necessary if new hot spots are detected.

Payette National Forest

In 1958, the Payette National Forest reported a possible buildup of Engelmann spruce beetle within the Fisher Creek timber sale which lies in the heart of the spruce type on the forest. The infestation was evaluated and evidence showed that both one- and two-year generation strains of the beetle were present.

Chemical control of the beetles within stumps, slash, cull logs, and of trap trees felled, reduced the Fisher Creek infestation.

The selective cut timber sale in Brown Creek failed to produce an increase in beetle populations. However, this sale was primarily a fir cut, with a minimum of spruce involved.

Between these two areas, Brown and Fisher Creeks, spruce logs were cold-decked from a road right-of-way between Goose Lake and Hazard Lake. These logs were heavily infested in 1959. Trap logs were laid down and absorbed some of the beetle population in 1960. However, these cold decks were so large that more than enough beetles remain to represent a potential buildup of beetles that could attack standing trees if the population is not reduced by next fall.

The spruce blowdown areas reported in last year's report in Lick Creek and Elk Creek summits did not produce beetle infestations of any consequence.

Manti-LaSal National Forest

Since 1958, control operations have been carried out against Engelmann spruce beetle populations in Dark and Unknown Canyons on the east side of Mt. Peale near Moab, Utah. The infestation involves lands of Federal, State, and private ownership.

The infestation originally started in culls, stumps, and long butts where spruce stands were being selectively cut and logged on State and private lands. Several thousand standing trees were attacked in 1957 and 1958. Since then, logging and chemical control measures have substantially reduced the infestation. In 1960, some chemical treating, along with burning decked material, was carried out by Forest Service crews on Federal land.

This year, selective logging operations are continuing on State land. Consequently, a considerable amount of slash is on the ground at the present time. It must be concluded that some of the trees left in the cutover areas may be windthrown, and if they fall in shaded areas, may be filled in by spruce beetles. If the slash and cull material is not disposed of in some effective manner, Engelmann spruce beetle populations could build up rapidly and cause another serious epidemic.

DISCUSSION

In 1959, nine infestations of Engelmann spruce beetle were reported in Region 4. Control operations were carried out against six of the infestations. The other three were small and did not show an increasing trend. Control methods utilized logging, application of toxic chemicals, and trap tree felling and subsequent treatment. In some infestations a combination of all three methods was used.

Control operations this year were conducted on the Bridger, Uinta, Ashley, Manti-LaSal, and Payette National Forests.

From the entomological viewpoint there is urgent need for continued control action on the Bridger spruce beetle outbreak. It now appears the most desirable action would be an all-out effort aimed at complete control of the infested area in the shortest time possible. Some additional control action may be necessary to complete the programs on the Uinta, Ashley, and Manti-LaSal infestations.

Two real problem areas exist that may cause trouble in the future. They are: The State lands involved in the Manti-LaSal project and the cold decked logs on the new road in the Goose Lake-Hazard Lake areas on the Payette National Forest. These areas will be watched closely so that the land managers can be notified promptly if control action becomes necessary.

DOUGLAS-FIR BEETLE

Annually, large volumes of Douglas-fir in Forest Service Region 4 are killed by the Douglas-fir bark beetle. Generally speaking, the Douglas-fir bark beetle is now quite active throughout the region. Douglas-fir stands on the Sawtooth and Dixie National Forests are particularly hard hit, with many large epidemic centers present on both forests. On the Targhee, Wyoming Division of the Bridger, Teton, Boise, and Payette National Forests damage is less intense than on the Sawtooth and Dixie but many infestation centers are present. On the other hand, some forests containing Douglas-fir stands are relatively free of Douglas-fir beetle. These are the Wasatch, Ashley, Salmon, Challis, and the Manti Division of the Manti-LaSal. Losses from Douglas-fir beetle are expected to continue at about the same level next year. Of course, fluctuations will occur with some infestation centers showing an upward trend in beetle population while others are expected to decrease.

FIR ENGRAVER BEETLES

Many thousand true firs are killed annually throughout the Intermountain region. A number of factors are involved in this mortality. The majority of true firs are killed by the fir engravers, Scolytus ventralis Lec., or Dryocoetes confusus Sw. Ground examination is required to determine the causal agent involved since it is not possible to separate causes of mortality from the air. The majority of the affected trees occur in rather inaccessible areas and are of relatively low economic value. Due to these facts and the large number of more pressing epidemics in need of evaluation, only infestations in those areas showing immediate high value, such as National Parks, were visited this year.

KEY TO BARK BEETLE INFESTATIONS

Mountain Pine Beetle ✓

Targhee National Forest
1. Moody Creek-Mud Springs
2. Sheridan Reservoir

Grand Teton National Park
3. Pilgrim Mountain (Park and Forest)
4. Signal-East Signal Mountain
5. Two Ocean Lake
6. Donoho Pt.-Jackson Lake

Teton National Forest
7. Pacific Creek
8. West Shoal Creek to Granite Creek
9. Spread Creek-Lost Creek
10. Antelope Mountain
11. Hoback Rim

Wasatch National Forest
12. Wasatch Project
13. Provo River-Iron Mine Mountain
14. Smith Morehouse drainage and Gardner Fork

Ashley National Forest
15. Brown Duck Creek
16. Miners Gulch
17. Bear Wallow (Forest & Indian land)
18. Lake Fork
19. Hells Canyon-Cow Creek

Toiyabe National Forest
20 Crystal Bay

Engelmann Spruce Beetle ✓

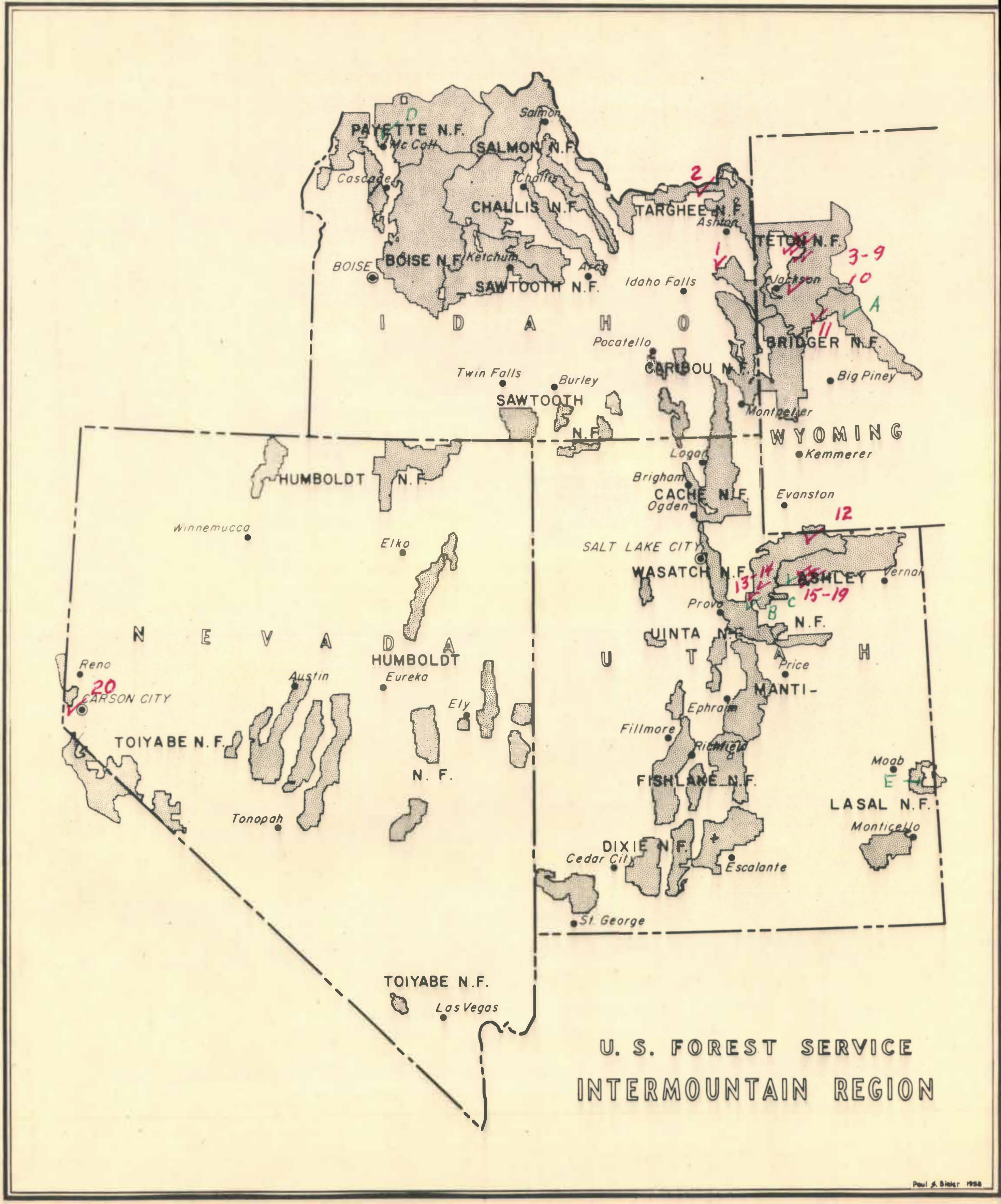
Bridger National Forest
A. Green River Project

Uinta National Forest
B. Uinta Project

Ashley National Forest
C. Hell Hole-McAffe Basin

Payette National Forest
D. Fisher Creek to Goose Lake-Hazard Lake

Manti-LaSal National Forest
E. Dark Canyon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BOISE
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Ketchum
SAWTOOTH N.F.
Arco
Idaho Falls
TARGHEE N.F.
Ashton
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Jackson
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BRIDGER N.F.
Big Piney
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Pocatello
CARIBOU N.F.
Montpelier
Twin Falls
Burley
SAWTOOTH
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WYOMING
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Winnemucca
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Tonopah
DIXIE N.F.
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St. George
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Las Vegas
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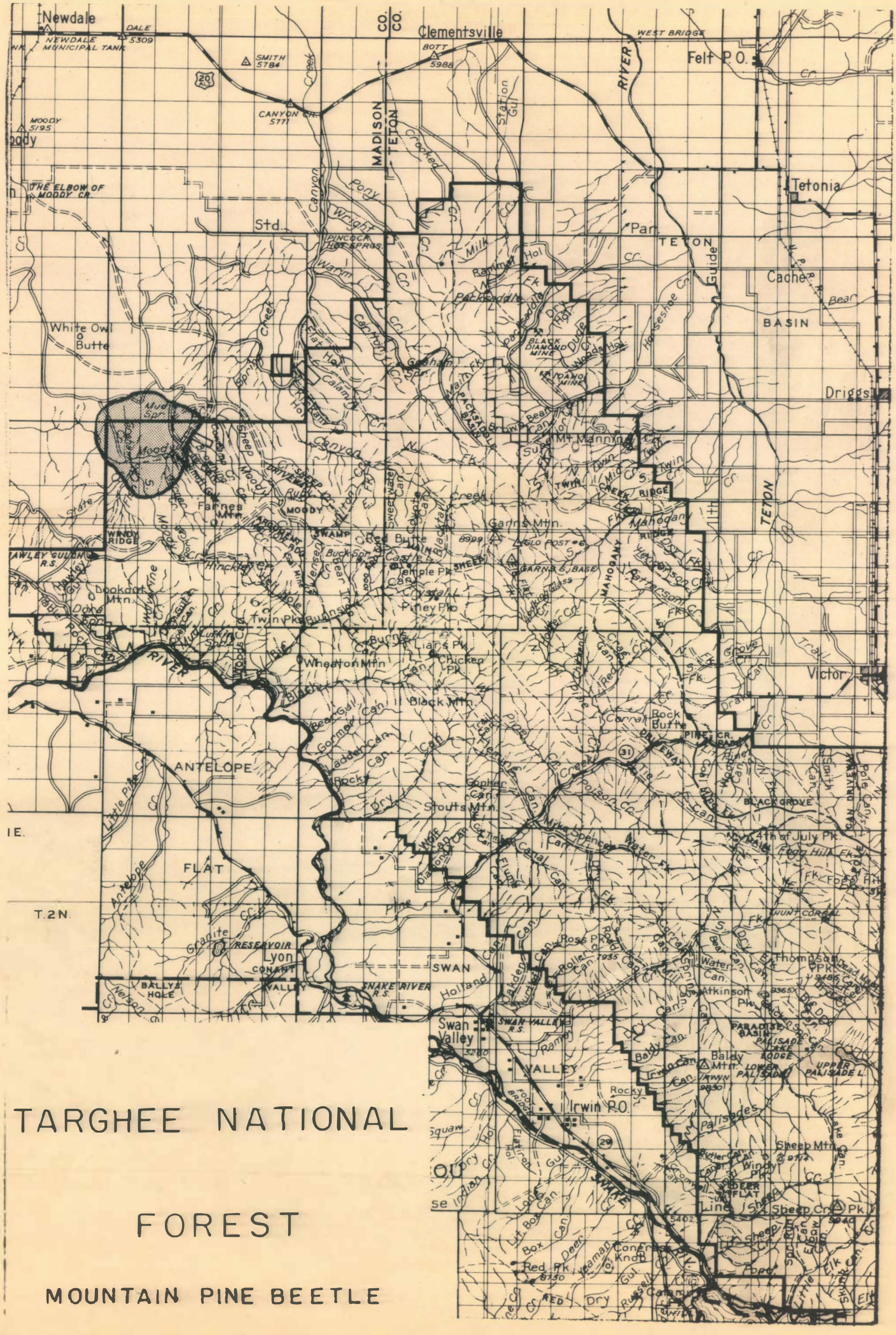
U. S. FOREST SERVICE

INTERMOUNTAIN REGION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Packsaddle
Par
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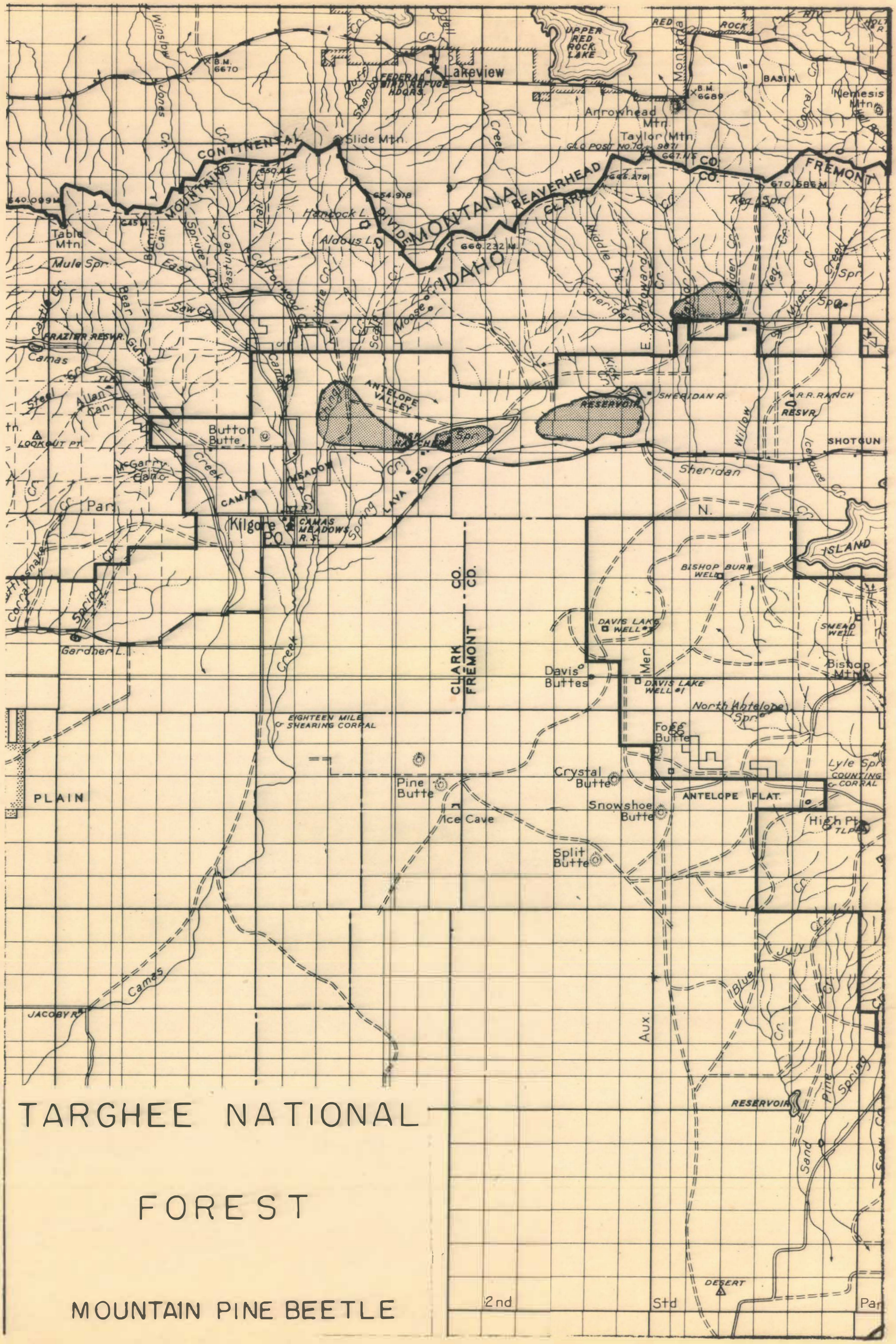
Guide
Tetonia
Cache
BASIN
Bear
White Owl Butte
Spring Creek
Horseshoe Cr.
BLACK DIAMOND MINE
Dude
Woods Hol
BALDON MINE
PACKSADDLE BASIN
Driggs
Mud Spr.
Moody
Sheep
Canyon
Brown Bear Can.
Mt Manning
Twin
S. Twin
Mid Cr.
TWIN CREEK RIDGE
S. RIDGE
Farnes Mtn.
DRIVEWAY
SHEEP CR.
MOODY
SWAMP
ARGUMENT RDG
Red Butte
Castle
Temple Pk.
SHEEP
Garns Mtn.
GLO POST
GARNS S. BASE
Mahogany
MAHOGANY
Henderson Cr.
Patterson Cr.
TETON
WINDY RIDGE
HAWLEY GULCH R.S.
Lookout Mtn.
Hinckley
Crystal
Piney Pk.
Twin Pks.
Burns
Liars Pk.
Chicken Pk.
RIVER
Wheaton Mtn.
Black Mtn.
Victor
Carnal
Rock Butte
PINE CR. PASS
31
DRIVEWAY
Poison Cr.
BLACK GROVE
ANTELOPE
Gormer Can.
Ladder Can.
Rocky
Dry
Gopher Can.
Stouts Mtn.
Mike Spencer Can.
Water Fk.
4th of July Pk.
Fogg Hill
IE.
FLAT
T.2N.
Antelope
Pine
Rose Pk.
HUNT CORRAL
Granite
RESERVOIR
Lyon
CONANT
VALLEY
SWAN
Holland
SNAKE RIVER R.S.
BALLYS HOLE
Nelson
Swan Valley
SWAN VALLEY R.S.
5280
Ramey
Atkinson Pk.
Thompson Pk.
PARADISE BASIN
PALISADE LAKE LODGE
Baldy Mtn.
IRWIN 9830
LOWER PALISADE
UPPER PALISADE L.
VALLEY
Rocky
Irwin P.O.
Palisades
Squaw
Indian Cr.
29
SNAKE
Sheep Mtn.
Windy Pk.
DEER FLAT
Sheep Cr.
Pk.
Box Can.
Deer
Red Pk.
Conant Knob
Russell
RED
Dry
Elk
RIV.

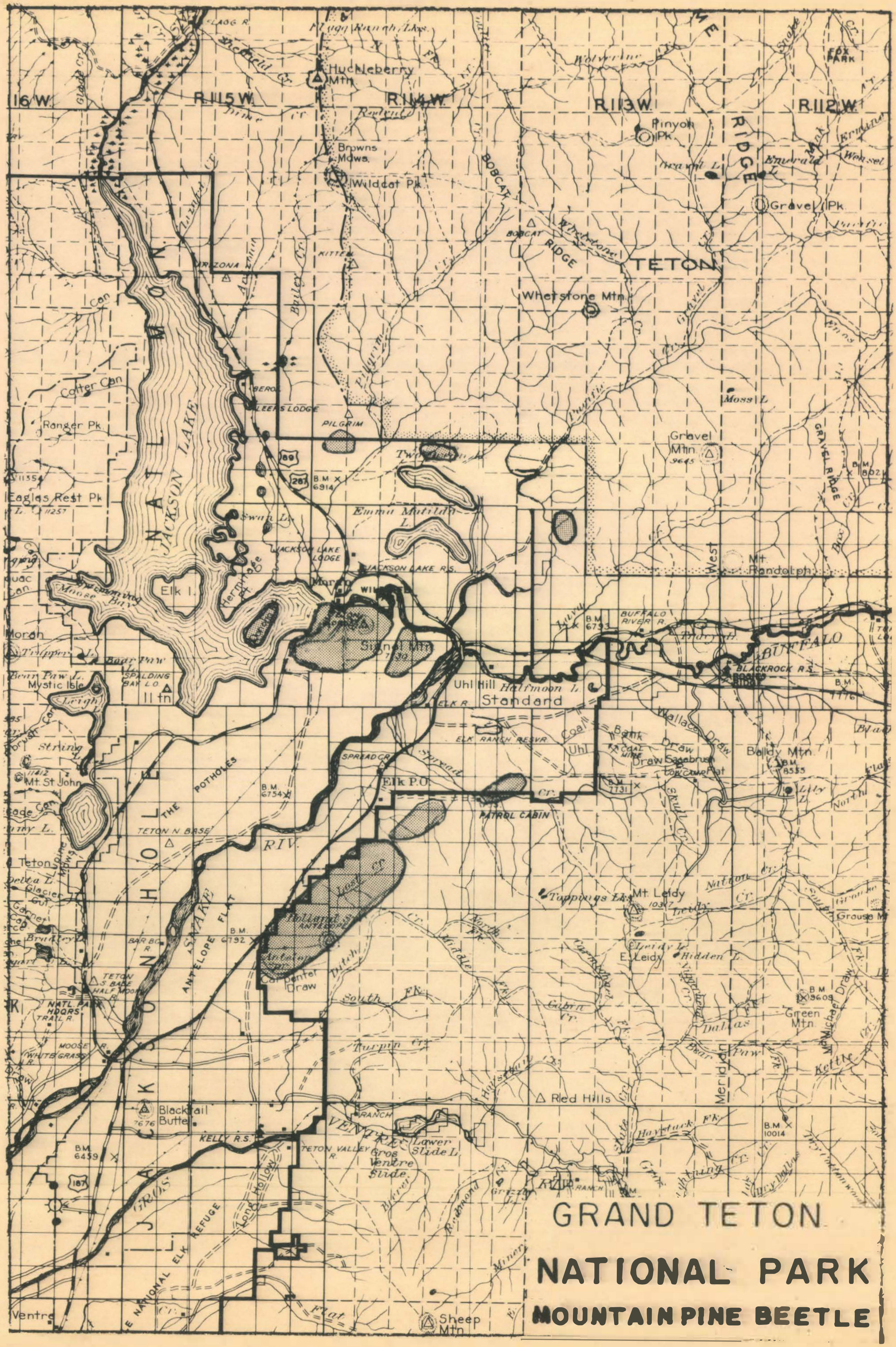
TARGHEE NATIONAL FOREST

MOUNTAIN PINE BEETLE

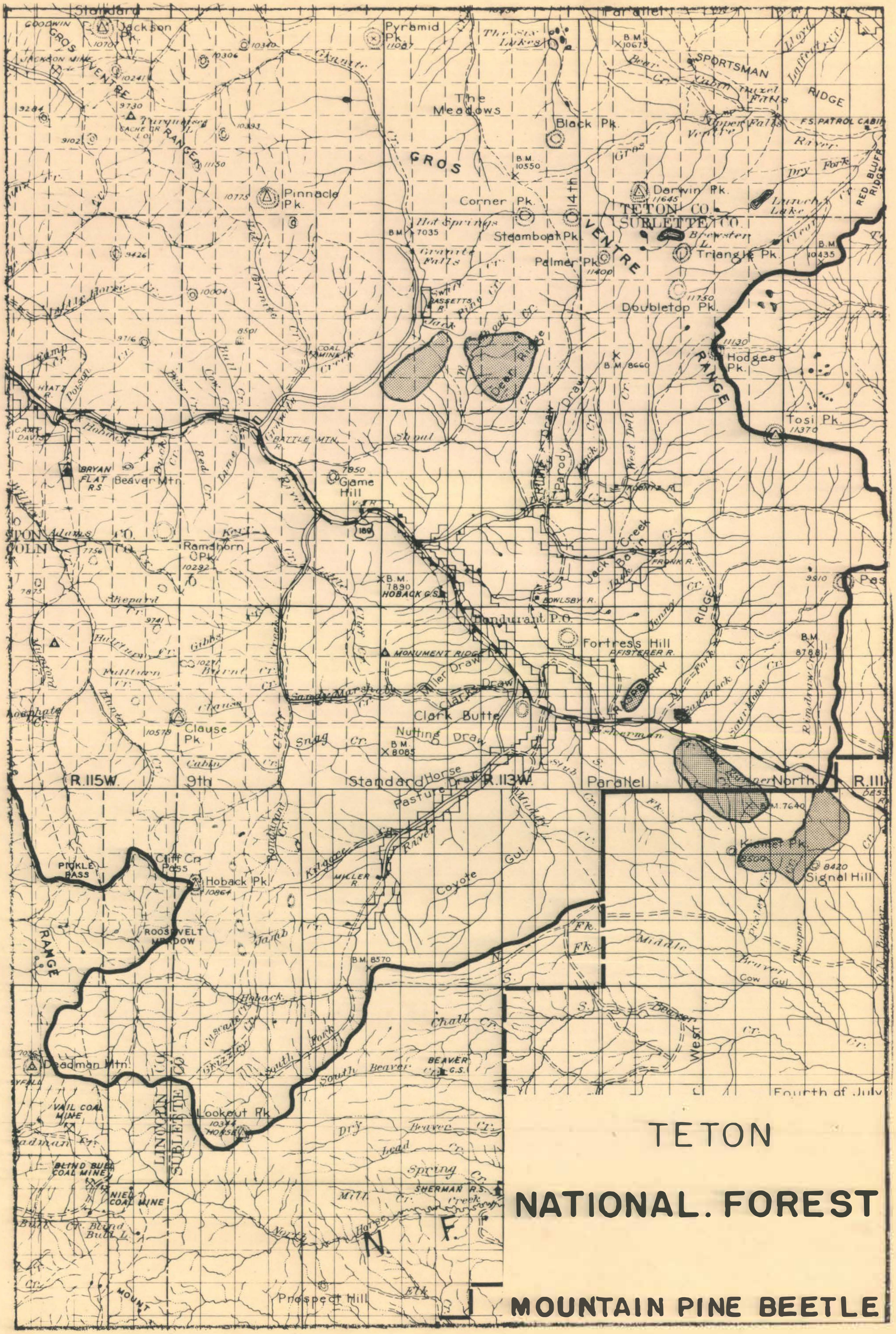

UPPER RED ROCK LAKE
RED ROCK
Lakeview
FEDERAL BIRD REFUGE HDQRS.
B.M. 6670
B.M. 6689
BASIN
Nemesis Mtn.
Arrowhead Mtn.
Taylor Mtn.
G.L.O. POST NO. 70 9871
Slide Mtn.
CONTINENTAL MOUNTAINS DIVIDE
MONTANA
IDAHO
BEAVERHEAD CO.
CLARK CO.
FREMONT CO.
Table Mtn.
Mule Spr.
Hancock L.
Aldous L.
Keg Spr.
FRAZIER RESVR.
Camas Cr.
ANTELOPE VALLEY
Button Butte
LOOKOUT PT.
McGarry Can.
RESERVOIR
SHERIDAN R.
R.R. RANCH RESVR.
SHOTGUN
Sheridan
Kilgore P.O.
CAMAS MEADOWS R.S.
CAMAS MEADOW
LAVA BED
Spring Cr.
ISLAND
BISHOP BURR WELL
DAVIS LAKE WELL #2
DAVIS LAKE WELL #1
Davis Buttes
Mer.
Bishop Mtn.
SMEAD WELL
CLARK CO.
FREMONT CO.
North Antelope Spr.
Fogg Butte
Lyle Spr.
COUNTING CORRAL
Gardner L.
EIGHTEEN MILE SHEARING CORRAL
PLAIN
Pine Butte
Crystal Butte
Snowshoe Butte
ANTELOPE FLAT
High Pt. TLP
Ice Cave
Split Butte
JACOBY R.
Camas
Blue
July Cr.
Aux.
RESERVOIR
Pine Spring
Sand
DESERT
2nd
Std
Par

TARGHEE NATIONAL FOREST

MOUNTAIN PINE BEETLE


R.116W.
R.115W.
R.114W.
R.113W.
R.112W.
Huckleberry Mtn.
Flagg Ranch Lks.
Sheffield Cr.
Wolverine
Fox Park
Pinyon Pk.
Browns Mdws.
Wildcat Pk.
BOBCAT
Bobcat Ridge
Whetstone
TETON
Whetstone Mtn.
Gravel L.
Emerald L.
Gravel Pk.
Ridge
Arizona
Kitten
Pilgrim
Bailey Cr.
Berol
Leeks Lodge
Colter Can.
Ranger Pk.
Eagles Rest Pk.
Jackson Lake
NATL. MON.
Twin Buttes
Emma Matilda L.
Swan L.
Jackson Lake Lodge
Jackson Lake R.S.
Hermitage Pt.
Elk I.
Moose Bay
Moran
Signal Mtn. 7730
Gravel Mtn. 9645
Moss L.
Mt. Randolph
West
Gravel Ridge
Buffalo River R.
Buffalo
Blackrock R.S.
Uhl Hill
Halfmoon L.
Standard
Elk R.
Elk Ranch Resvr.
Coal
Uhl
Bank Draw
Sagebrush Draw
Lowcave Flat
Baldy Mtn.
Lily L.
Wallace Draw
Mystic Isle
Leigh
Spalding Bay L.O.
String
Mt. St. John
The Potholes
Teton N Base
Spread Cr.
Elk P.O.
Patrol Cabin
Riv.
Snake
Teton
Glacier Gul.
Bradley
Antelope Flat
Lost Cr.
Holland Sp.
Antelope
Carpenter Draw
Ditch
Mt. Leidy 10317
Tappins Lks.
Leidy L.
E. Leidy
Hidden L.
Nation Cr.
Grouse Mt.
Green Mtn.
Dallas Fk.
Bear Paw
Meridian
Red Hills
Turpin Cr.
South Fk.
Middle Fk.
North Fk.
Gros Ventre
Lower Slide L.
Gros Ventre Slide
Natl. Park Hdqrs.
Moose
White Grass
Blacktail Butte 7676
Kelly R.S.
Teton Valley R.
Jackson Hole
National Elk Refuge
Long Hollow
Sheep Mtn.
Ventre
Haystack Fk.
Kettle
Redmond Cr.
Grizzly
Flat

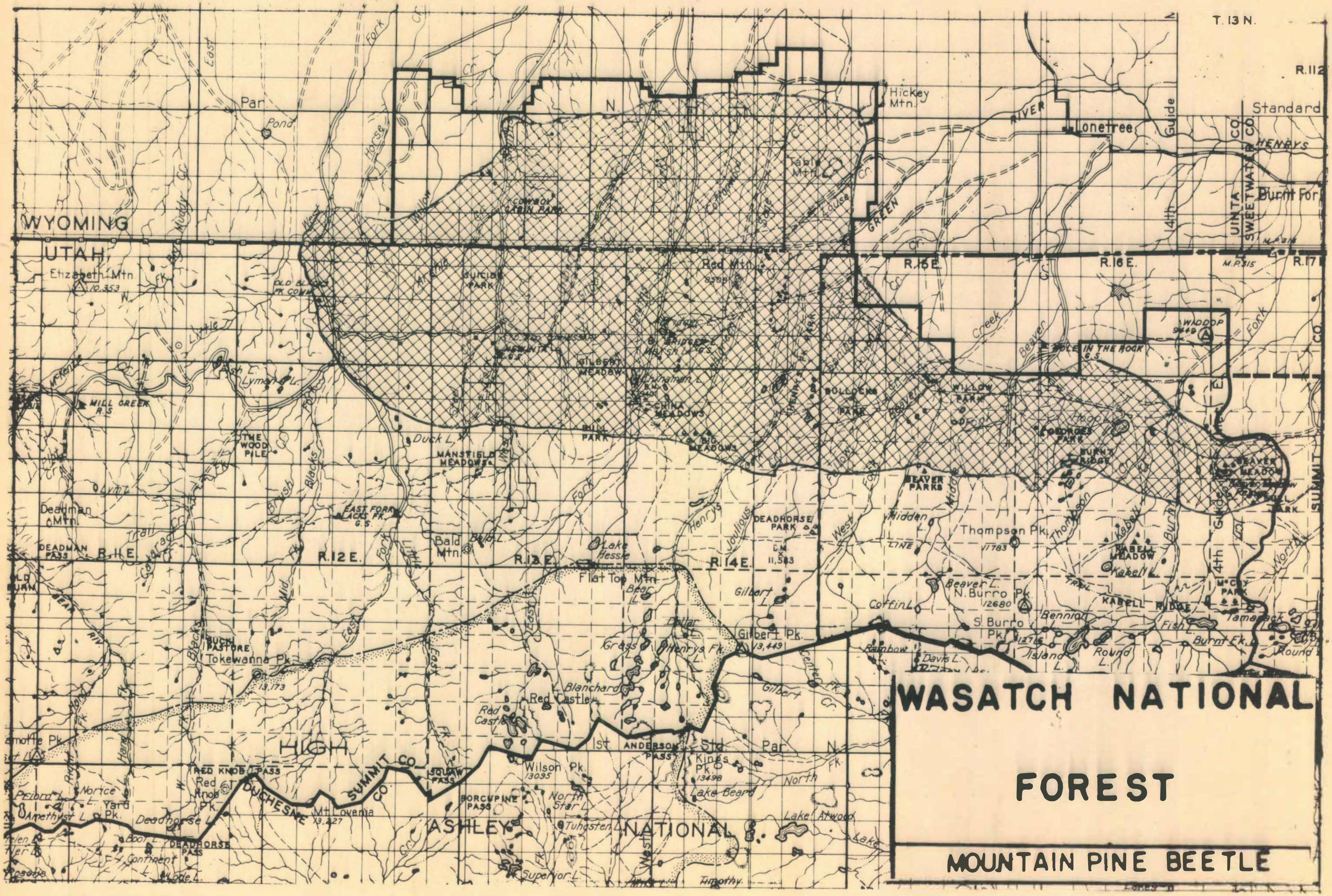
GRAND TETON
NATIONAL PARK
MOUNTAIN PINE BEETLE


Standard Parallel
Jackson Pk.
Pyramid Pk. 11087
Gros Ventre Range
The Meadows
Black Pk.
Sportsman Ridge
Pinnacle Pk.
Corner Pk.
Darwin Pk. 11645
Teton Co.
Sublette Co.
Steamboat Pk.
Palmer Pk.
Triangle Pk.
Doubletop Pk.
Hodges Pk.
Tosi Pk. 11370
Battle Mtn.
Bryan Flat R.S.
Beaver Mtn.
Game Hill
Ramshorn Pk. 10292
Hoback G.S.
Bondurant P.O.
Fortress Hill
Monument Ridge
Clark Butte
Clause Pk.
R.115W.
9th
Standard Parallel
R.113W.
R.111
Kismet Pk.
Signal Hill
Cliff Cr. Pass
Pickle Pass
Hoback Pk. 10864
Roosevelt Meadow
Range
Deadman Mtn.
Lincoln Co.
Sublette Co.
Lookout Pk.
Vail Coal Mine
Blind Bull Coal Mine
Sherman R.S.
Beaver G.S.
Prospect Hill
N.F.
Fourth of July

TETON

NATIONAL. FOREST

MOUNTAIN PINE BEETLE

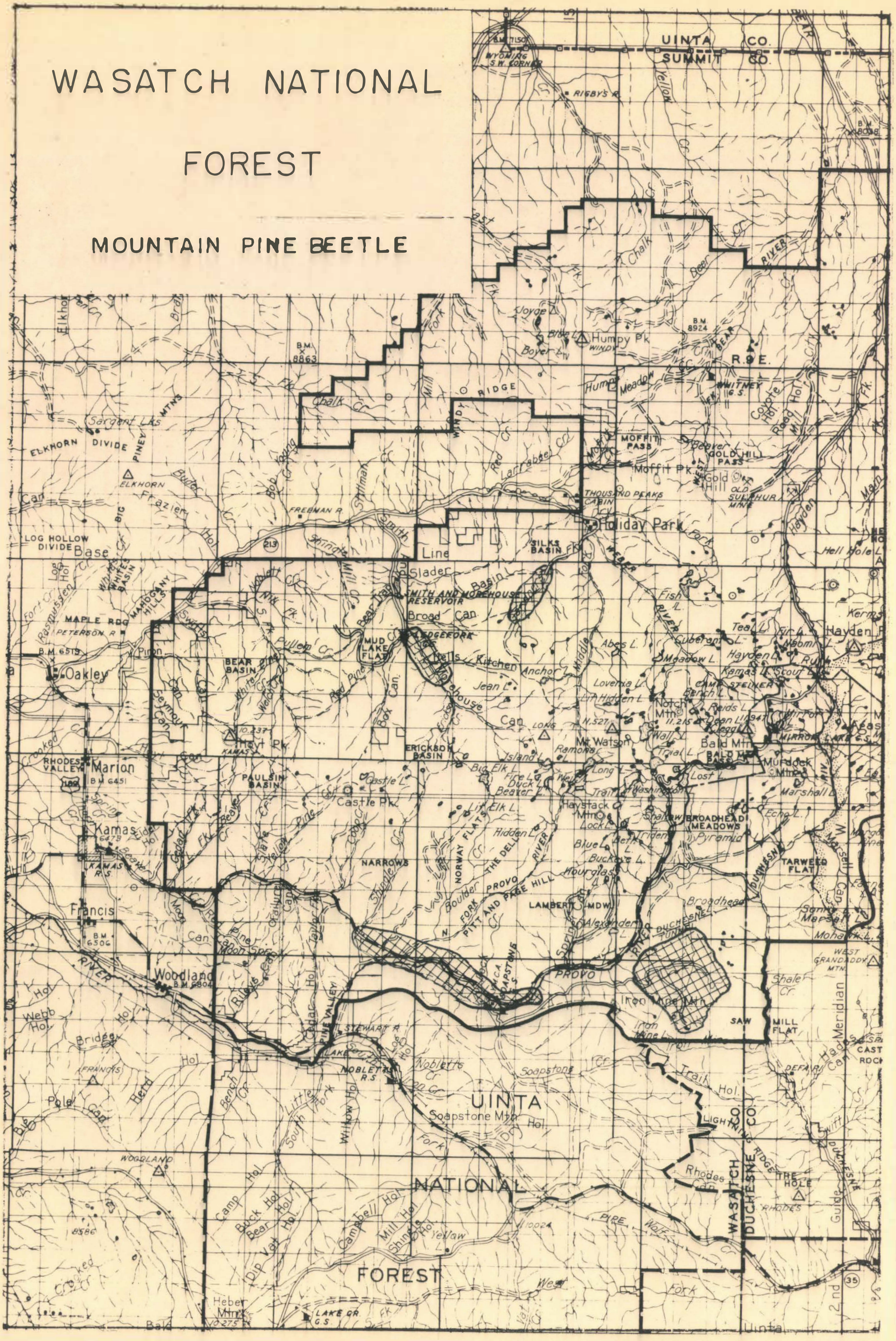

T. 13 N.
R.112
WYOMING
UTAH
Hickey Mtn.
Lonetree
Standard
HENRYS
Burnt Fork
UINTA CO.
SWEETWATER CO.
GREEN RIVER
Table Mtn.
COWBOY CABIN PARK
Par Pond
Etizabeth Mtn 10,353
OLD BLACKS FK COMM
SUICIDE PARK
Red Mtn.
R.15E.
R.16E.
R.17
M.P. 315
M.P. 316
WIDDOP 9449
HOLE IN THE ROCK G.S.
GILBERT MEADOW
BRIDGER L.
Marsh L.
Chinaman L.
CHINA MEADOWS
BIG MEADOWS
BULLOCKS PARK
WILLOW PARK
GEORGES PARK
BURNT RIDGE
BEAVER MEADOW
MILL CREEK R.S.
Lyman L.
THE WOOD PILE
Duck L.
MANSFIELD MEADOWS
EAST FORK BLACKS FK. G.S.
BEAVER PARKS
DEADHORSE PARK
Thompson Pk. 11783
KABELL MEADOW
Kabell L.
SUMMIT CO.
Deadman Mtn
DEADMAN PASS
R.11E.
R.12E.
R.13E.
R.14E.
Bald Mtn.
Lake Hessie
Flat Top Mtn.
Gilbert L.
Beaver L.
N. Burro Pk. 12680
S. Burro Pk.
Coffin L.
Gilbert Pk. 13,449
KABELL RIDGE
Bennion
Island L.
Round L.
Fish L.
Burnt Fk. L.
Tamarack L.
McCOY PARK
BUCK PASTURE
Tokewanna Pk. 13,173
Red Castle
Blanchard L.
Henrys Fk.
Dollar L.
Grass L.
Rainbow
Davis L.
HIGH
SUMMIT CO.
DUCHESNE CO.
ASHLEY NATIONAL
RED KNOB PASS
Red Knob Pk.
SQUAW PASS
Wilson Pk. 13095
1st ANDERSON PASS
Kings Pk. 13498
Std Par N.
Lake Beard
Lake Atwood
Mt Lovenia 13,227
PORCUPINE PASS
North Star L.
Tungsten L.
Superior L.
Timothy
Amethyst L.
Yard Pk.
Deadhorse L.
DEADHORSE PASS
Continent L.
Lamotte Pk.

WASATCH NATIONAL FOREST

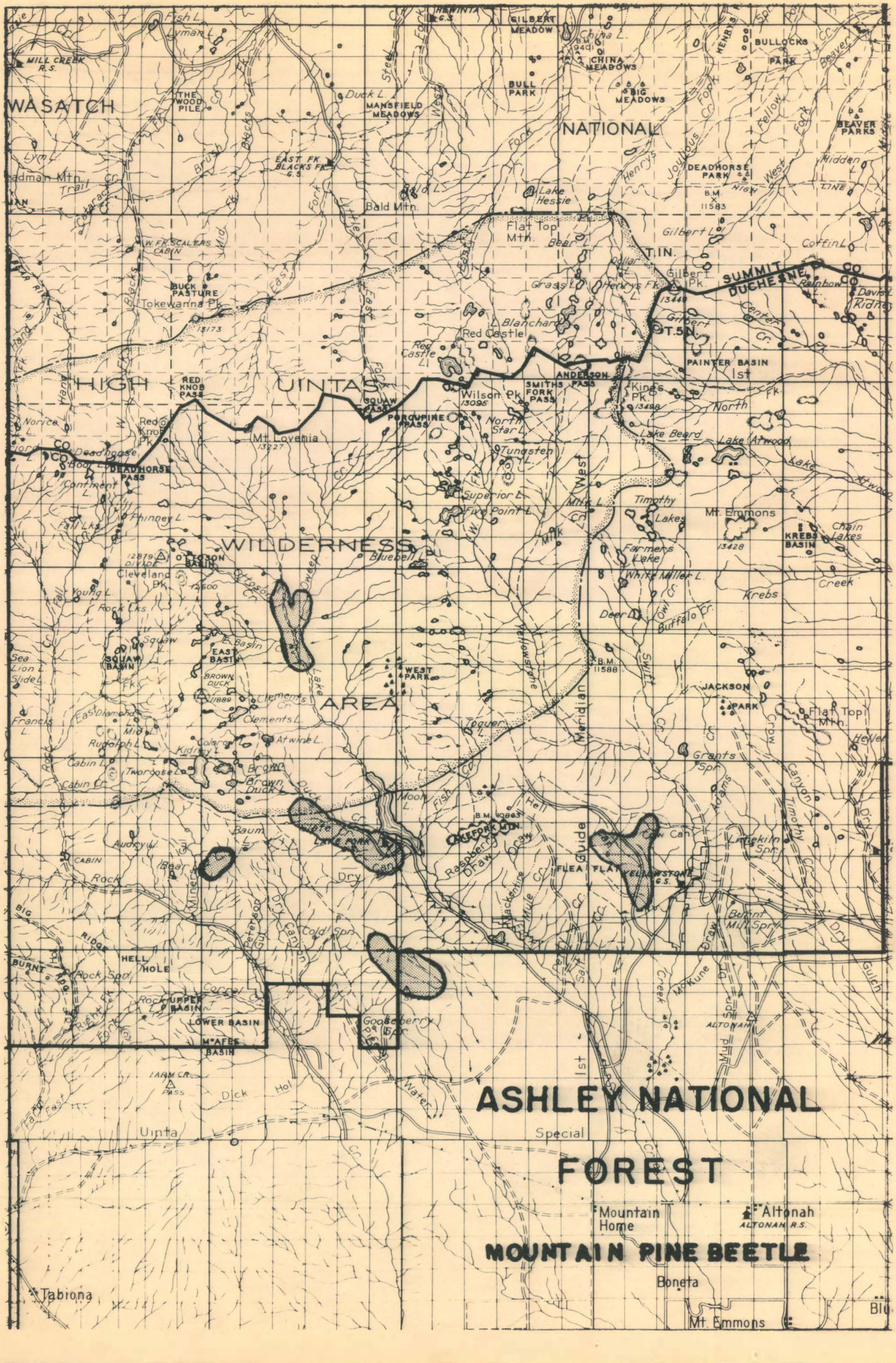
MOUNTAIN PINE BEETLE

WASATCH NATIONAL FOREST

MOUNTAIN PINE BEETLE



UINTA CO.
SUMMIT CO.
WYOMING S.W. CORNER
RIGBYS R.
Yellow Cr.
Chalk Cr.
Bear R.
Humpy Pk
Joyce L.
Boyer L.
B.M. 8924
B.M. 8863
R.9 E.
WHITNEY G.S.
WINDY RIDGE
Humpy Meadow
MOFFIT PASS
Moffit Pk.
GOLD HILL PASS
Gold Hill
OLD SULPHUR MINE
Beaver L.
Coyote Hol.
Reed Hol.
Hayden Fk.
Red Cr.
Larrabee Cr.
Stillman Cr.
Bob Young Cr.
FREEMAN R.
Smith
THOUSAND PEAKS CABIN
Holiday Park
Weber
SILKS BASIN
Hell Hole
ELKHORN DIVIDE
Elkhorn
Sargent Lks
PINEY MTNS
Frazier Can
Butler Cr.
BIG
LOG HOLLOW DIVIDE
Base Line
WHITE BASIN
MAHOGANY HILLS
MAPLE RDG
PETERSON R.
Rasmussen Cr.
B.M. 6515
Oakley
Piñon
Slader Basin
SMITH AND MOREHOUSE RESERVOIR
Broad Can.
MUD LAKE FLAT
LEDGEFORK
Kitchen
Anchor
Jean L.
Morehouse Can
Pullem Cr.
BEAR BASIN
White Pine
Red Pine
Box Can.
Seymour Can.
10,237
Hoyt Pk.
KAMAS
ERICKSON BASIN
Fish L.
Abes L.
Teal L.
Cuberant L.
Meadow L.
Hayden L.
Kamas L.
Scout L.
Hayden Pk.
Naomi L.
Ruth
Lovenia L.
Lit Hidden L.
Notch Mtn 11,215
Reids L.
Mt Watson
Ramona
Wall L.
Trial L.
Bald Mtn
BALD MTN PASS
Mirror L.
MIRROR LAKE
Murdock Mtn
Lost L.
Marshall L.
Echo L.
Island L.
Big Elk L.
Fire L.
Duck L.
Beaver L.
Lit Elk L.
Long L.
Washington
Haystack Mtn
Lock L.
Shallow
Trident
BROADHEAD MEADOWS
Pyramid
Hidden L.
Blue L.
Beth L.
Buckeye L.
Hourglass
NORWAY FLATS
THE DELL
PROVO RIVER
Boulder Cr.
FORK PROVO
PITT AND PAGE HILL
LAMBERT MDW
Alexander
DUCHESNE TUNNEL
Broadhead
TARWEED FLAT
Sonny L.
Marsell L.
Mohawk L.
WEST GRANDADDY MTN
Shale Cr.
Iron Mine Mtn
Iron Mine L.
SAW MILL FLAT
SOAPSTONE G.S.
RHODES VALLEY
Marion
B.M. 6451
Crooked Cr.
Spring
Kamas 6473
KAMAS R.S.
Beaver
Castle L.
Castle Pk.
PAULSIN BASIN
Yellow Pine
Slate Cr.
NARROWS
Shingle Cr.
Francis
B.M. 6506
Moon Can
Pine Moon Spr
Riley's Can
Woodland
B.M. 6804
RIVER
Webb Hol
Bridge Hol
FRANCIS
Pole Can
Herd Hol
Cedar Hol
PINE VALLEY
STEWART R.
NOBLETTS R.S.
Nobletts Cr.
Soapstone Cr.
Soapstone Mtn
UINTA
NATIONAL
FOREST
Trail Hol.
LIGHTNING RIDGE
Rhodes Can
WASATCH CO.
DUCHESNE CO.
THE HOLE
RHODES
Guide
Meridian
DEFA'S
CASTLE ROCK
WOODLAND
8586
Crooked Cr.
Bench Cr.
Little South Fork
Willow Hol
Camp Hol
Buck Hol
Bear Hol
Dip Vat Hol
Campbell Hol
Mill Hol
Shingle Hol
Yellow
10024
Pine
Wolf
West Fork
Heber Mtn
10275
LAKE CR. G.S.
Bald
Uinta
2nd
35



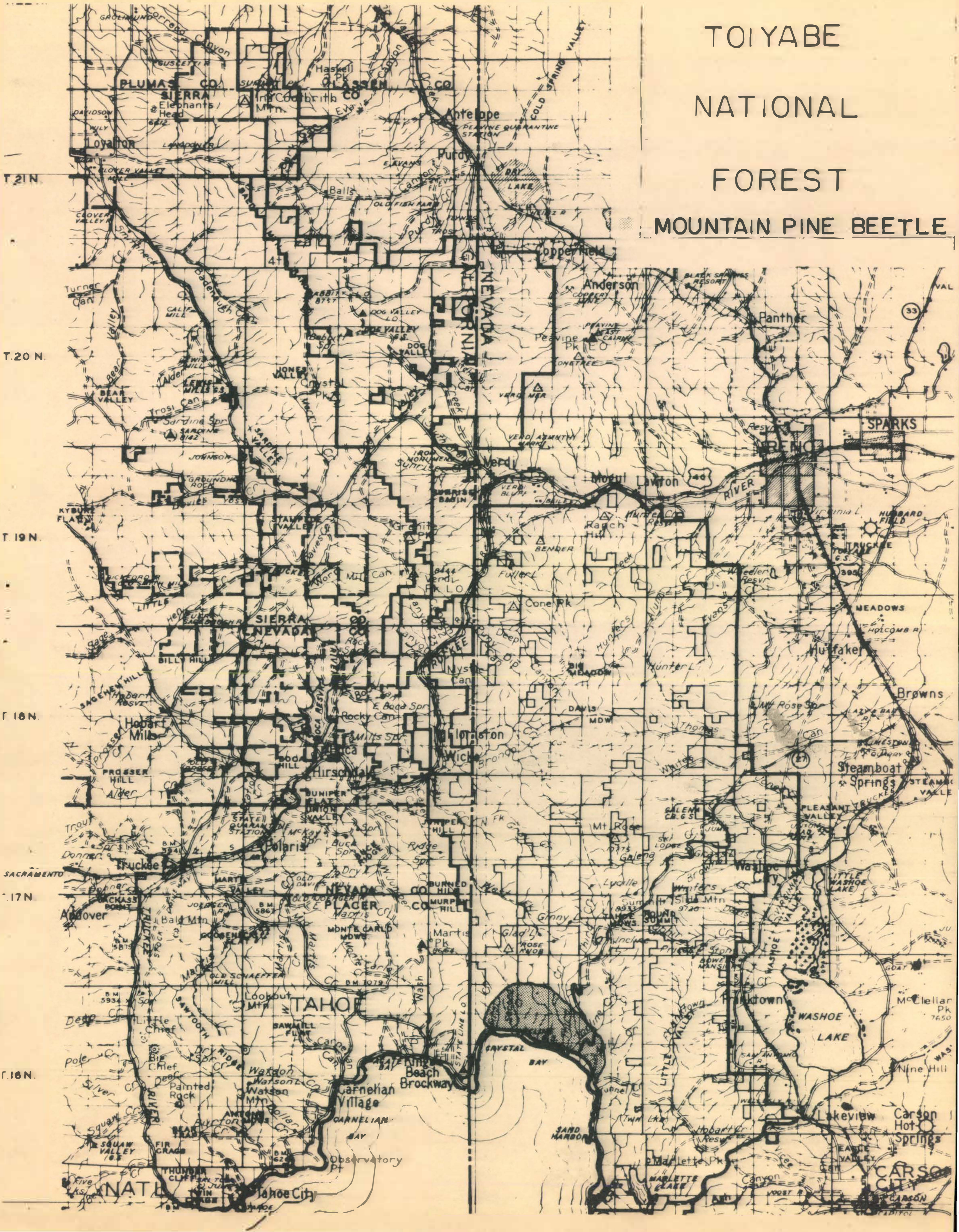
ASHLEY NATIONAL FOREST

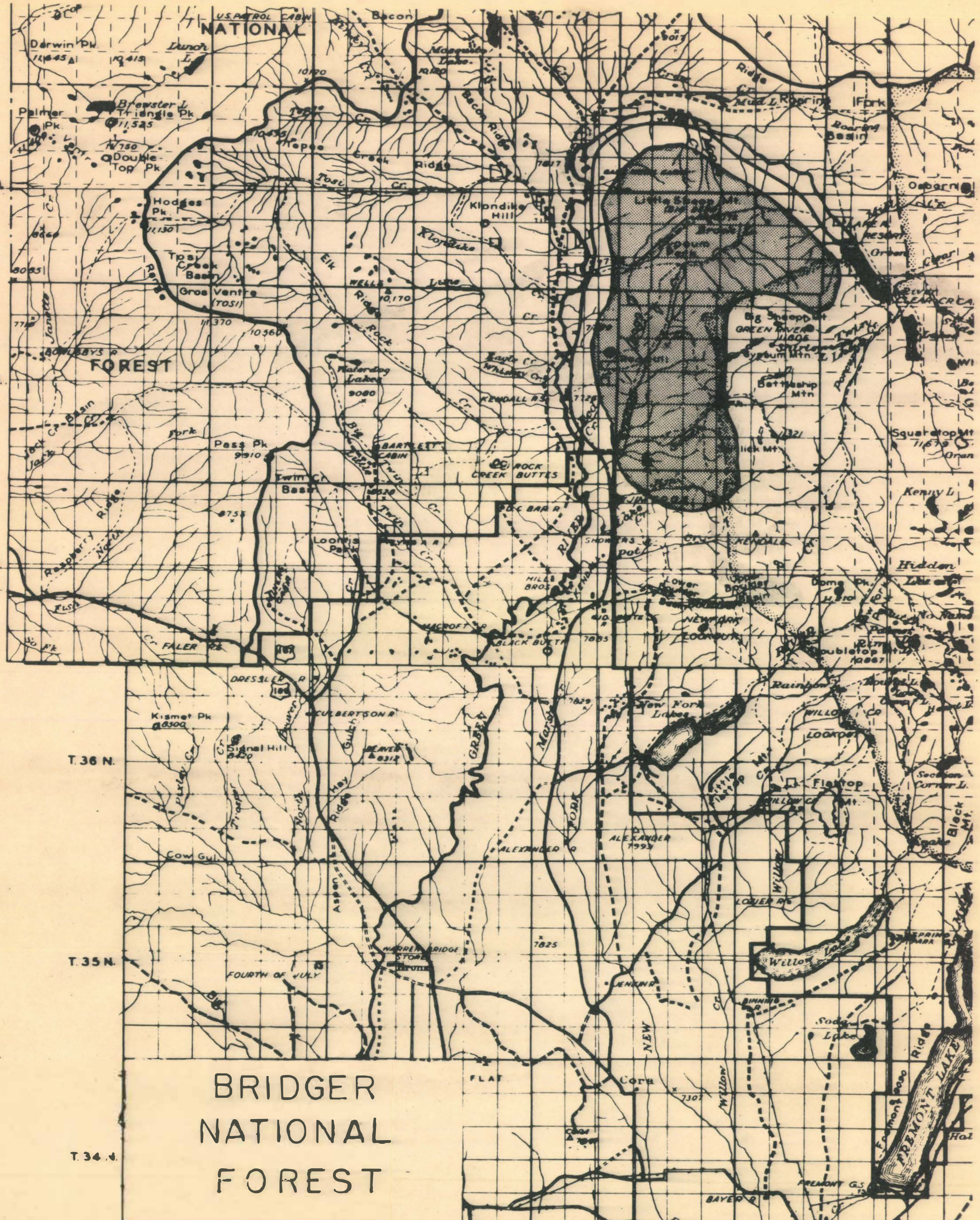
MOUNTAIN PINE BEETLE

WASATCH
NATIONAL
HIGH UINTAS
WILDERNESS
AREA
SUMMIT CO.
DUCHESNE CO.
T.1N.
T.5N.
Mill Creek R.S.
Fish L.
Lyman L.
The Wood Pile
Duck L.
Mansfield Meadows
East Fk Blacks Fk G.S.
Gilbert Meadow
China L.
China Meadows
Bull Park
Big Meadows
Bullocks Park
Beaver Parks
Deadhorse Park
Hidden L.
B.M. 11583
Lake Hessie
Bald Mtn.
Flat Top Mtn.
Gilbert L.
Coffin L.
Gilbert Pk. 13449
Rainbow L.
Davis L.
Buck Pasture
Tokewanna Pk. 13173
W. Fk. Scalers Cabin
Red Castle
Blanchard L.
Red Knob Pass
Squaw Pass
Porcupine Pass
Anderson Pass
Smiths Fork Pass
Wilson Pk 13095
Kings Pk. 13498
Painter Basin
Mt. Lovenia 13227
Red Knob Pk.
Deadhorse Pass
Norice L.
North Star L.
Tungsten L.
Lake Beard
Lake Atwood
Superior L.
Five Point L.
Milk L.
Timothy Lakes
Mt. Emmons 13428
Chain Lakes
Krebs Basin
Farmers Lake
White Miller L.
Deer L.
Phinney L.
Fall Lks.
Confinent L.
12879 Divide
Ottoson Basin
Cleveland Pk. 12500
Young L.
Rock Lks.
Squaw Basin
East Basin
Brown Duck 11889
Clements L.
Atwine L.
Bluebell L.
West Park
Sea Lion L.
Slide L.
Francis L.
Rudolph L.
Kidney L.
Twin Pots
Cabin L.
Brown Duck L.
Moon L.
Toquer L.
B.M. 11588
Jackson Park
Flat Top Mtn.
Grants Spr.
Lake Fork
Lake Fork Mtn.
B.M. 10863
Raspberry Draw
Flea Flat
Yellowstone G.S.
Meridian
Guide
Baum L.
Audrey L.
Cabin
Bear L.
Big Ridge
Hell Hole
Burnt Rdg.
Rock Spr.
Upper Basin
Lower Basin
McAfee Basin
Gooseberry Flat
Peterson Gul.
Dry Canyon
Cold Spr.
Burnt Mill Spr.
Altonah
Farm Cr. Pass
Dick
Uinta
Special
Mountain Home
Altonah R.S.
Boneta
Mt. Emmons
Tabiona
1st
Blu

TOIYABE NATIONAL FOREST

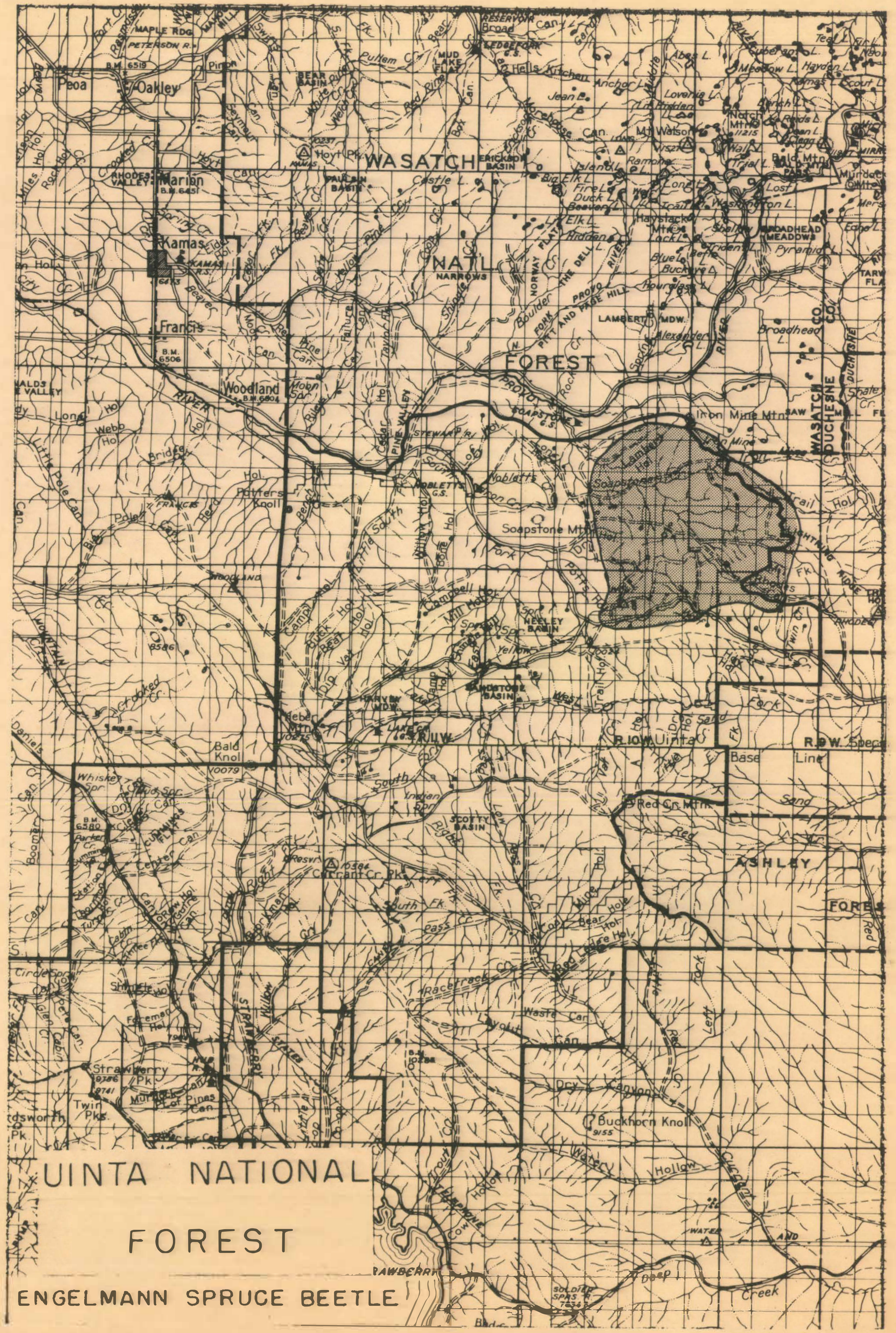
MOUNTAIN PINE BEETLE


T.21N.
T.20N.
T.19N.
T.18N.
T.17N.
T.16N.
PLUMAS CO.
SIERRA
LASSEN CO.
Elephants Head
Loyalton
Antelope
Peavine Quarantine Station
Purdy
Dry Lake
Balls
Old Fish Farm
Copperfield
Anderson
Black Springs Resort
Panther
Peavine Pk
Turner Can
Bear Valley
Dog Valley
Crystal Pk
Sardine Valley
Verdi
Mogul
Lawton
Reno
Sparks
River
Ranch Hill
Bender
Hunter L
Hubbard Field
Meadows
Huffaker
Browns
Steamboat Springs
Pleasant Valley
Cone Pk
Davis Mdw
Sierra
Nevada
Nevada
California
Hobart Mills
Prosser Hill
Boca
Hirschdale
Floriston
Juniper Flat
Polaris
Truckee
Sacramento
Donner
Andover
Bald Mtn
Martis Pk
Mt Rose
Galena
Washoe City
Little Washoe Lake
Slide Mtn
Glad L
Rose Knob
Tahoe
Lookout Mtn
Sawtooth Ridge
Little Chief
Big Chief
Painted Rock
Watson Mtn
Kings Beach
Brockway
Crystal Bay
Carnelian Village
Carnelian Bay
Observatory Pt
Tahoe City
Sand Harbor
Marlette Pk
Marlette Lake
Franktown
Washoe Lake
McClellan Pk
Nine Hill
Lakeview
Carson Hot Springs
Eagle Valley
Carson City
Squaw Valley
Fir Crags
Thunder Cliff
Twin Crags
Five Lks
Natl
Truckee River
State Line L.O.


NATIONAL
FOREST
U.S. PATROL CABIN
Darwin Pk. 11,645
Brewster L.
Triangle Pk. 11,525
Palmer Pk.
Double Top Pk.
Hodges Pk. 11,130
Tosi Creek Basin
Gros Ventre (TOSI)
Tosi Cr.
Klondike Hill
Wells Ridge 10,170
Rock Cr.
Kendall R.S.
Waterdog Lakes 9080
Bartlett's Cabin
Rock Creek Buttes
Pass Pk. 9910
Twin Cr. Basin
Loomis Park
Jack Cr.
Raspberry Ridge
North Fork
TO JACKSON
Fish Cr.
FALER R.S.
DRESSLER R.
CULBERTSON R.
Kismet Pk. 8500
Signal Hill
Beaver
Hay Gulch
North Ridge
Cow Gul.
Aspen Ridge
GREEN RIVER
Mill Bros.
Macroft R.
Black Butte
Little Sheep Mt.
Gypsum Peak
Big Sheep Mt.
Gypsum Mtn.
Battleship Mtn.
Mud L.
Roaring Fork
Roaring Fork Basin
Osborn
Green River Lake Resort
Squaretop Mt. 11,679
Kenny L.
Hidden Lake
Dome Pk.
Doubletop Mt. 12,067
New Fork Lakes
Lower Boulder Basin
Upper Boulder Basin
Newfork Lookout
Rainbow L.
Willow Cr.
Flattop Mt.
Section Corner L.
Black Mt.
Alexander R.
Alexander 7993
Warren Bridge Store
Fourth of July
Jenkins
Willow Lake
Spring Ranch
Soda Lake
Fremont Lake
Fremont Ridge
Fremont G.S.
Cora
Flat
Bayer R.
Duck Cr.
Pinedale
Pinedale R.S.
Daniel
T. 39 N.
T. 38 N.
T. 37 N.
T. 36 N.
T. 35 N.
T. 34 N.

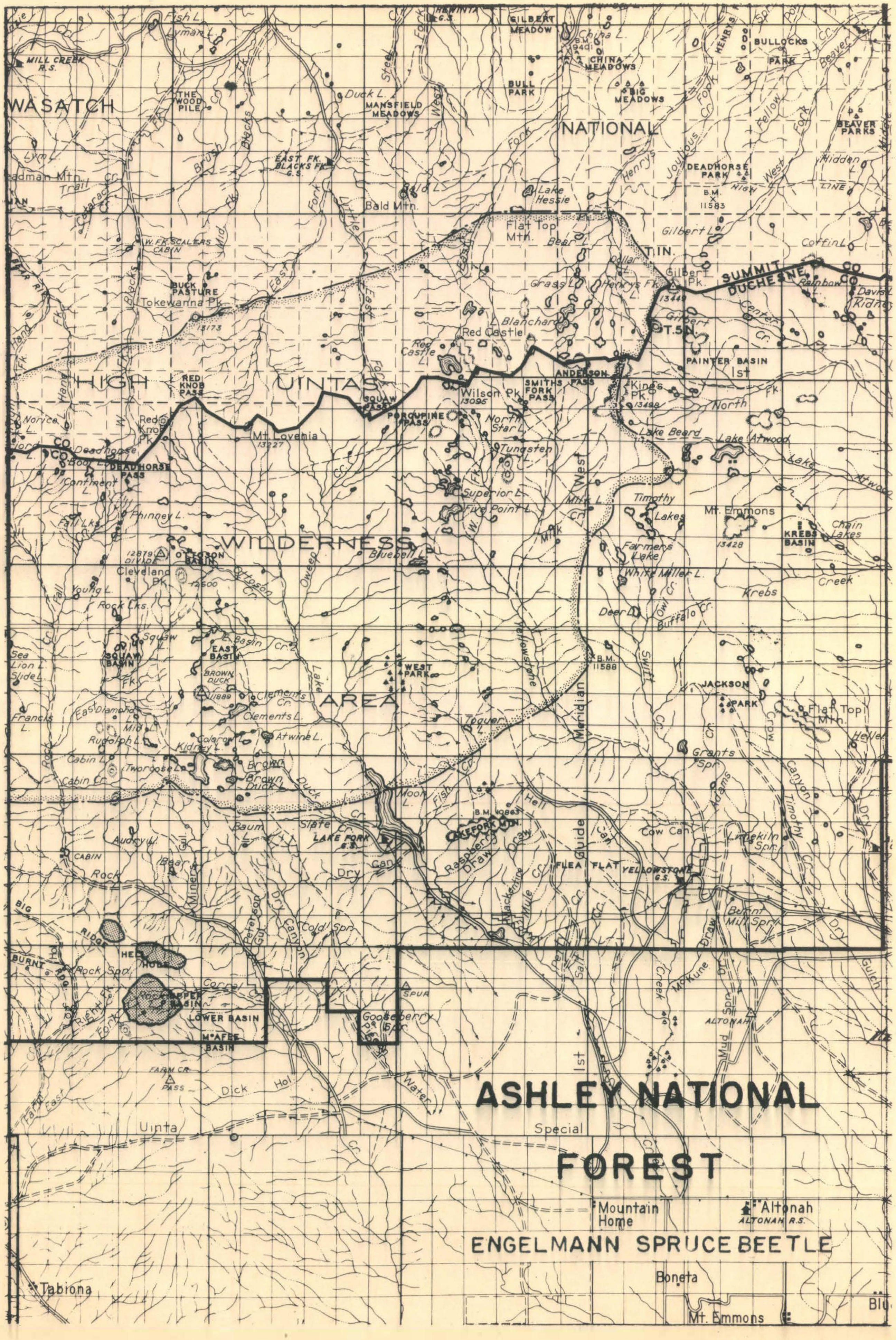
BRIDGER
NATIONAL
FOREST

ENGELMANN SPRUCE BEETLE


WASATCH
NAT'L
FOREST
Peoa
Oakley
Marion
Kamas
Francis
Woodland
PROVO RIVER
Soapstone Mtn.
Soapstone G.S.
Iron Mine Mtn.
Hoyt Pk.
Mt. Watson
Bald Mtn.
Washington L.
Trial L.
Lost L.
Broadhead L.
Broadhead Meadows
Castle L.
Erickson Basin
Haystack Mtn.
Lambert Mdw.
Alexander L.
Pitt and Page Hill
Norway Flat
The Dell
Weber Mtn.
Bald Knol
Currant Cr. Pk.
Red Cr. Mtn.
Scotty Basin
Neeley Basin
Sandstone Basin
Strawberry Pk.
Twin Pks.
Buckhorn Knoll
Dry Canyon
Wasatch Co.
Duchesne Co.
Lightning Ridge
Ashley
R. 10 W.
R. 11 W.
Uinta
Base Line
Strawberry
Willow
Water Hollow
Currant Creek
Racetrack Cr.
Red Ledge Hol.
Waste Can.
Soldier Sprs.

UINTA NATIONAL FOREST

ENGELMANN SPRUCE BEETLE

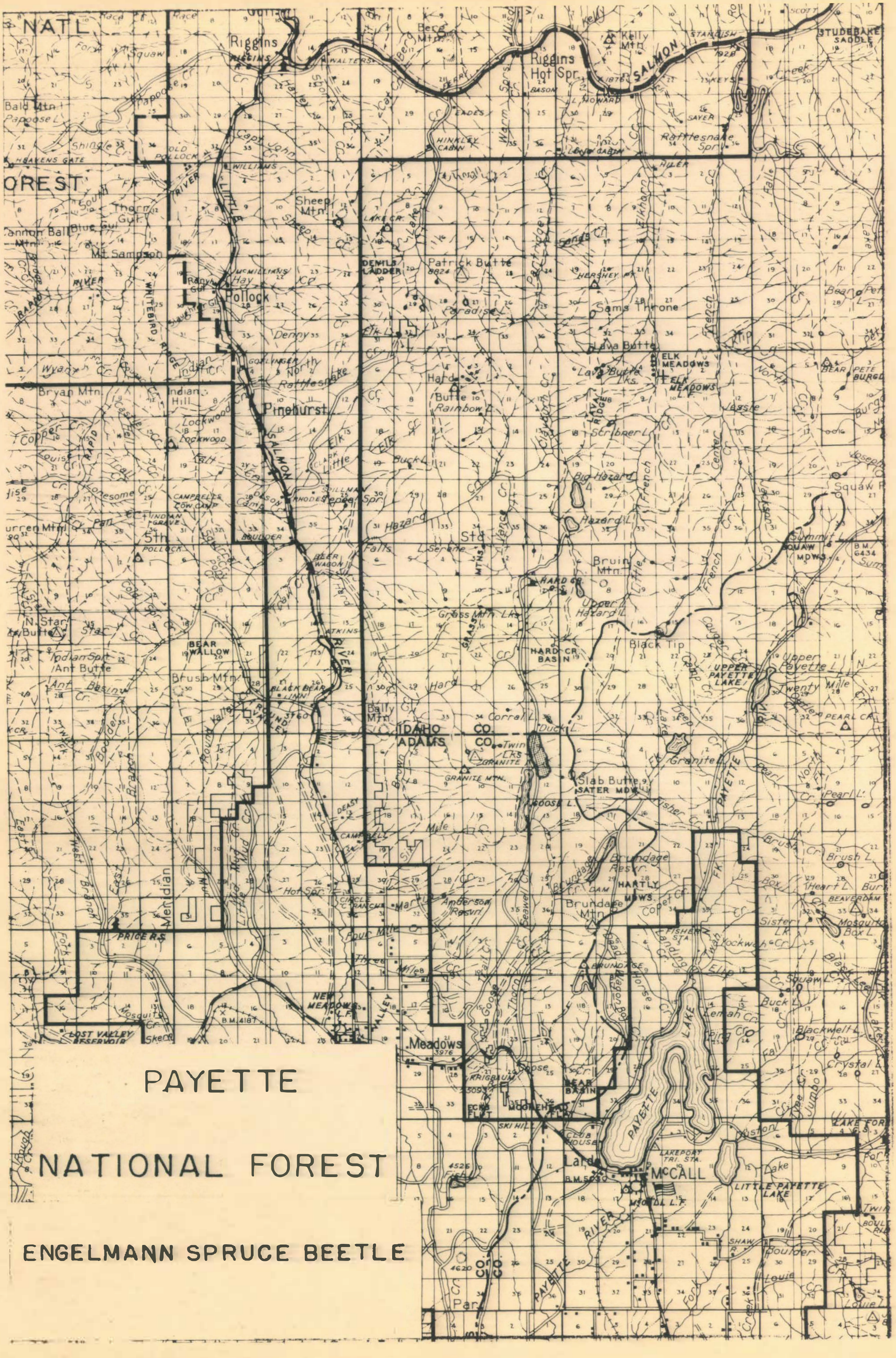


ASHLEY NATIONAL FOREST

Special

ENGELMANN SPRUCE BEETLE

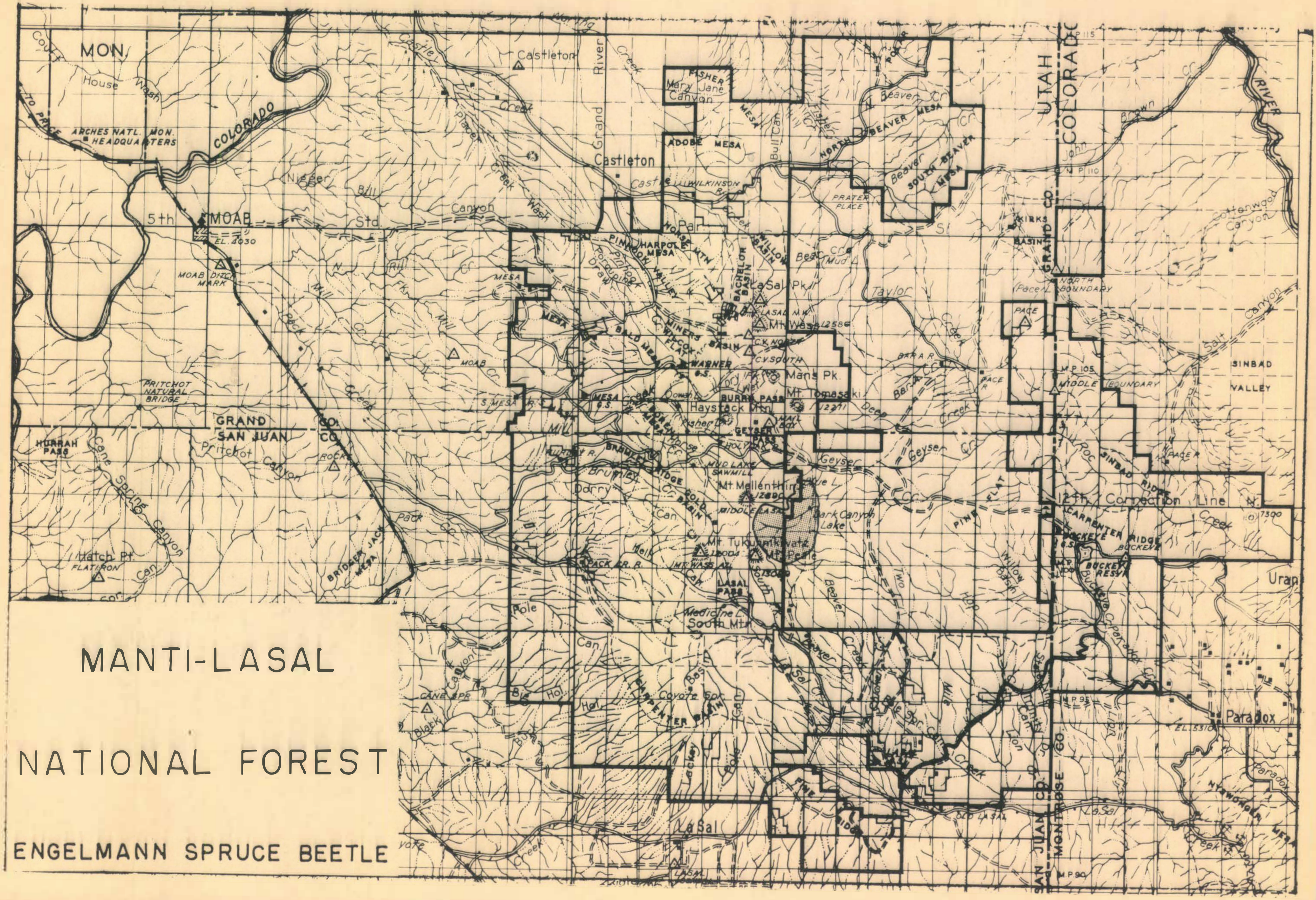
WASATCH
NATIONAL
HIGH UINTAS
WILDERNESS
AREA
MILL CREEK R.S.
THE WOOD PILE
MANSFIELD MEADOWS
GILBERT MEADOW
CHINA MEADOWS
BULL PARK
BIG MEADOWS
BULLOCKS PARK
BEAVER PARKS
DEADHORSE PARK
EAST FK. BLACKS FK. G.S.
Bald Mtn.
Lake Hessie
Flat Top Mtn.
Gilbert Pk. 13449
SUMMIT
DUCHESNE
CO.
Tokewanna Pk. 13173
BUCK PASTURE
W. FK. SCALERS CABIN
Red Castle
RED KNOB PASS
SQUAW PASS
PORCUPINE PASS
Mt. Lovenia 13227
Wilson Pk. 13095
SMITHS FORK PASS
ANDERSON PASS
Kings Pk. 13498
PAINTER BASIN
DEADHORSE PASS
Red Knob Pk.
Tungsten L.
Superior L.
Five Point L.
Lake Atwood
Timothy Lakes
Mt. Emmons
KREBS BASIN 13428
Chain Lakes
Farmers Lake
White Miller L.
Cleveland Pk. 12600
OTTOSON BASIN
SQUAW BASIN
E. BASIN
BROWN DUCK
WEST PARK
Clements L.
Atwine L.
Kidney L.
Brown Duck L.
Moon L.
LAKE FORK G.S.
LAKEFORK MTN.
B.M. 10863
JACKSON PARK
Flat Top Mtn.
Grants Spr.
Cow Can.
Limekiln Spr.
FLEA FLAT
YELLOWSTONE G.S.
Burnt Mill Spr.
Yellowstone
Meridian
Guide
BIG RIDGE
HELL HOLE
ROCK CREEK BASIN
LOWER BASIN
McAFEE BASIN
Gooseberry
SPUR
FARM CR. PASS
Dick Hol.
Uinta
Mountain Home
Altonah
ALTONAH R.S.
Boneta
Mt. Emmons
Tabiona


NATL
FOREST
Riggins
Riggins Hot Spr.
SALMON
Kelly Mtn
Berg Mtn
STUDEBAKER SADDLE
Bald Mtn
Papoose L.
HEAVENS GATE
OLD POLLOCK
Capt John
Sheep Mtn
LAKE CR.
Patrick Butte 8824
DEVILS LADDER
Cannon Ball Mtn
Mt Sampson
Blue Gul.
Thorn Gul.
WHITEBIRD RIDGE
Pollock
Denny
HERSHEY PT
Sams Throne
Lava Butte
Lava Butte Lks.
ELK MEADOWS
Bryan Mtn
Indian Hill
Pinehurst
LOCKWOOD
Hard Butte
Rainbow L.
Scribner L.
Big Hazard L.
Hazard L.
Squaw Pt.
Lonesome Cr.
CAMPBELLS COW CAMP
INDIAN GRAVE
5th
Std
Bruin Mtn
SQUAW MDWS.
B.M. 6434
N. Star Butte
Indian Spr.
Ant Butte
Ant Basin
BEAR WALLOW
Brush Mtn
HARD CR. BASIN
Black Tip
Upper Hazard L.
Upper Payette L.
UPPER PAYETTE LAKE
Twenty Mile
PEARL CR.
BLACK BEAR INN
ROUND VALLEY
Bally Mtn.
IDAHO CO.
ADAMS CO.
Corral L.
Duck L.
Twin Lks.
GRANITE MTN.
Goose L.
Slab Butte
SATER MDW.
Granite L.
Pearl L.
Brundage Resvr.
HARTLY MDWS.
Brundage Mtn
Meridian
PRICE R.S.
CIRCLE C RANCH
Four Mile
Three Mile
Anderson Resvr.
FISHER STA.
Mosquito Box L.
BEAVERDAM
LOST VALLEY RESERVOIR
B.M. 4187
NEW MEADOWS L.F.
Meadows 3976
KRIGBAUM
BEAR BASIN
ECKS FLAT
MOOREHEAD FLAT
SKI HILL
CLUB HOUSE
PAYETTE LAKE
LAKEPORT TRI. STA.
Lardo
McCALL
B.M. 5030
McCALL L.F.
LITTLE PAYETTE LAKE
Blackwell L.
Crystal L.
LAKE FORK
PAYETTE RIVER
Boulder
Louie
SHAW
4620
4526

PAYETTE

NATIONAL FOREST

ENGELMANN SPRUCE BEETLE



MOAB
EL. 4030
5th
Std. Par.
Castleton
COLORADO
ARCHES NATL. MON. HEADQUARTERS
TO PRICE
Court House Wash
Castle Creek
Grand River
Placer Creek
Wash
Nigger Bill Canyon
FISHER
Mary Jane Canyon
MESA
ADOBE MESA
WILKINSON R.
Bull Can.
NORTH BEAVER MESA
SOUTH BEAVER MESA
Beaver Cr.
PRATER PLACE
UTAH
COLORADO
GRAND CO.
KIRKS BASIN
NORTH BOUNDARY
PAGE
MIDDLE BOUNDARY
John Brown Cr.
RIVER
Cottonwood Canyon
Salt Canyon
SINBAD VALLEY
SINBAD RIDGE
12th Correction Line N.
CARPENTER RIDGE
BUCKEYE
BUCKEYE RES.
Uran
Paradox
EL. 5310
NYSWONGER MESA
HORSE MTN.
HARPOLE MESA
PINHOOK VALLEY
Porcupine Draw
BACHELOR BASIN
WILLOW BASIN
LaSal Pk.
Mt. Waas 12586
MINERS BASIN
WILCOX FLAT
BALD MESA
WARNER G.S.
Mans Pk.
Mt. Tomasaki 12271
BURRO PASS
Haystack Mtn.
GEYSER PASS
Geyser Cr.
Deep Creek
Taylor Creek
Mud Cr.
PINE FLAT
Mt. Mellenthin 12690
Dark Canyon Lake
MIDDLE LASAL
Mt. Tukuhnikivatz 12004
Mt. Peale 13089
LASAL PASS
Medicine South Mtn.
BRUMLEY RIDGE
GOLD BASIN
Brumley Cr.
Dorry Can.
PACK CR. R.
Pole Can.
MOAB DITCH MARK
MOAB
Mill Creek
Pack Cr.
PRITCHOT NATURAL BRIDGE
GRAND SAN JUAN CO. CO.
Pritchot Canyon
HURRAH PASS
Cane Spring Canyon
Hatch Pt.
FLATIRON
BRIDGER JACK MESA
CANE SPR.
Black Canyon
Big Hol.
CARPENTER BASIN
Coyote Spr.
Lackey
Beaver Cr.
LaSal Cr.
Two Mile
Lion Can.
Creek
LaSal
OLD LASAL
PINE RIDGE
SAN JUAN CO.
MONTROSE CO.
M.P. 115
M.P. 110
M.P. 105
M.P. 95
M.P. 90
Willow Basin
Hop Cr.
7300

MANTI-LASAL

NATIONAL FOREST

ENGELMANN SPRUCE BEETLE